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1 ABSTRACT

2 A pseudo-chaotic coding/modulation method. The coding method
3 exploits symbolic dynamics of a chaotic map at the transmitter to encode data.
4 The encoding synthesizes the chaotic map based upon the data to be transmitted.
5 In a preferred embodiment, pseudo-chaotic iterates are generated from a digital
6 implementation of a Bernoulli shift map. The output of the shift map is translated
7 by a mapping, preferably implemented by a digital signal processor, to allow
8 transitions between states in a transmitted signal to differ, and the translated map
9 is used to drive a modulator (for example PPM, FSK, PSK, QAM, etc.). In the
10 specific case of pulse-position modulation (PPM) the translated map is used to
11 modulate pulse train positions within a periodic synchronization frame. The
12 preferred embodiment uses a shift register to implement an approximation of the
13 Bernoulli shift map acting as a form of convolutional code with a number of states
14 equal to the symbolic states defined on the chaotic map. A receiver may use
15 fewer states and still decode the data signal, allowing receiver scalability.

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